Frankly it seems to us that the work is beyond these outsiders, but we are sure that those who are competent will find it a work of much value. T. D.

Kurzes Lehrbuch der organischen Chemie. Von Professor Dr. A. Bernthsen. Neunte Auflage, bearbeitet in gemeinschaft mit Dr. Ernst Mohr. Braunschweig, Fr. Vieweg und Sohn. 1906. Pp. xxii + 638.

The approval with which this book has been received is indicated by the fact that it has reached its ninth edition and has been translated into English, Russian and French. This success is well deserved. Within a comparatively small compass it gives a remarkably comprehensive oversight of the fundamental principles and of the important compounds of organic chemistry. The most important change in this edition is the addition of a third division called 'Heterocyclic Compounds,' though a considerable portion of the material in this division was formerly given under the division called 'Benzene Derivatives,' but in this edition named 'Isocyclic Compounds.' The aliphatic compounds are still called 'Methane Derivatives,' as in former editions.

On p. 70 Schorlemmer's classification of paraffins as normal, iso-, meso-, and neo-paraffins is still given, although the last two classes are never mentioned in current literature and have been practically forgotten by most organic chemists. It is a pity we have no means of eliminating unnecessary and little used terms of this sort.

The most characteristic and valuable features of the book are the clear, concise statements given at the introduction of each new class of compounds, presenting the most important methods of preparation for the class and the facts on which our knowledge of the structure of the characteristic group of the class is based. The fault of the book, if it has one, lies in the brief description of an excessive number of compounds, far beyond the possibility of memory for any one. The effect must be bewildering and discouraging to the beginner. W. A. Noyes.

DISCUSSION AND CORRESPONDENCE.

AN UNUSUAL METEOR.

To the Editor of Science: On page 151 of your issue for August 3, Mr. E. E. Davis, of Norwich, N. Y., describes a very interesting meteor train observed by him about 5:30 or 6 P.M., when traveling between Cortland and Elmira, N. Y. The changes in his own location during the fifteen minutes must have had an appreciable influence on the appearance of this trail, but will scarcely alter our general conclusion that it was a typical case illustrating and settling a matter that has caused a little speculation among students of the subject. If a meteor leaves a visible train behind it we are apt to think that this is a series of luminous particles, lying in a straight or gently curved line, and that they will, by reason of unequal gravity, resistance of the air and possibly winds in the upper atmosphere, drift along unequally, so that the straight trail may gradually become irregular. This may be true in some cases, but it is incredible that any plausible movement in the thin upper air should affect the course of the scattered luminous particles. They must be considered as moving, with rapidly diminishing velocity, under the influence of three forces—namely, their initial momentum, the attraction of gravitation and a very gentle resistance from the atmosphere. In most cases the initial momentum is mainly that due to the straight-line motion of the original meteor; but in some cases this meteor may be revolving on its axis in a manner quite analogous to the less rapid rotation of a comet's nucleus, and just as the comet of 1875 sent out a series of tails from its revolving nucleus, so with the streams of material issuing from these rapidly revolving meteors. The diagrams submitted by Mr. Davis would indicate that five rotations were made in that portion of its track represented by his third curve; the motions of the particles outward from the meteor's track were so slow that it made a barely appreciable sine curve, or a broadening of the track, in his first and second curves, but a very large jagged sine curve in his sixth, or last, curve. This latter broadening re-

quired ten minutes of time, and if we had exact measurements of angles and times we should undoubtedly from these curves be able to deduce the rate of rotation of the meteor, and possibly its mass.

Most of the aerolites that come to the earth show, by their pitted surfaces, that the meteoric material is being split off or ejected quite uniformly from the whole surface; but some meteors, like some comets, may have only a very few regions on the surface from which material is ejected with any special force. In Mr. Davis's meteor of October 13 we seem to have a case in which some one spot on the side of the meteor, namely somewhere between its head and its tail, ejected its material freely and with considerable force, in a direction at right angles to the axis of rotation, or the line joining head and tail: it represents the rare case of a symmetrical revolving meteor.

CLEVELAND ABBE.

WASHINGTON, D. C.,
August 15, 1906.

SOME 'DEFINITIONS' OF THE DYNE.

IT would seem comparatively easy for any one whose mind has dwelt comprehendingly upon the relation $F=ma$ to define correctly the unit of force in terms of mass and acceleration. But such is evidently not the case. Of the text-books of physics immediately at hand, four give incorrect definitions of the dyne. In each case the author is a man of high and wide reputation as a writer and teacher. In quoting the definitions in question, I have taken the liberty of italicizing the words to be omitted with advantage.

(*a*) Force: dyne. 1 g. given unit acceleration *in 1 sec.*

(*b*) The practical unit of force is the dyne. * * * It produces unit acceleration of unit mass *in unit time.*

(*c*) The absolute unit of force (in the C. G. S. system) is called a dyne, and is that force which *in one second* is capable of giving to a gram-mass an acceleration of one centimeter per second.

(*d*) The absolute unit of force is the force that, acting *for unit of time* upon unit of mass, will produce unit of acceleration. * * * The centimeter-gram-second (C. G. S.) unit of force is the force that, acting *for one second* upon a mass of one gram, produces an acceleration of one centimeter per second. It is called a dyne.

The first two books are intended for universities and colleges, the latter two for preparatory schools, and all four, I believe, have been widely used.

It is perhaps proper to state that each of these authors gives a correct definition in terms of mass, time and change of velocity, but each seems implicitly to ignore the fact that acceleration is not change of velocity, but is *rate* of change of velocity. To conclude, the dyne is the force that, acting on a mass of one gram, gives to it C. G. S. unit acceleration (for which there is no name), irrespective of the time during which the force acts upon the mass, whether it be the millionth part of one second, or one million eons. $F=ma$, and when $m=1$, and $a=1$, then $F=1$.

Similar errors are of course committed in defining the poundal. The text from which the quotation (*d*) above is taken gives:

The foot-pound-second (F. P. S.) unit of force is the force that, applied to one pound of matter *for one second,* will produce an acceleration of one foot per second. It is called a poundal.

And a fifth book, also for preparatory schools, states:

In the F. P. S. system the unit is the poundal, which is the force that on being applied to 1 lb. of matter *for 1 sec.* will give to it an acceleration of 1 ft.

In this last case, the same mistake is made in the general definition of the absolute unit of force, but the dyne, specifically, escapes with a defective definition in terms of mass, time and change of velocity.

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SPECIAL ARTICLES.

A PECULIAR MUTATION OF THE PINE MARTEN.

A TRAPPER'S skin, without skull, of a pine marten (*Mustela americana actuosa* Osgood) recently offered for sale to the National Museum by Mr. James Aitchison, Nulato, Alaska,